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ABSTRACT

This learning module on understanding performance objectives, criterion-referenced measures, and performance guides is one of nine developed for use in training administrators, teachers, and prospective teachers in the utilization of Vocational-Technical Education Consortium of States (V-TECS) catalogs. Readings are provided on the following subject areas: elements of V-TECS catalogs, performance objectives, performance guides, and criterion-referenced measures; and the proficiencies and attitudes necessary for completing a performance objective. A glossary of terms, a glossary self check, and self checks following each section of readings are provided. (The checkout activity--included in the instructor's handbook, CE 017 440--consists of multiple choice questions keyed to the module behavioral objectives. The modules are designed for use with individuals or with groups.) (JH)

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Implementing Performance-Based Vocational Education
Utilizing V-TECS Catalogs

MODULE 2

UNDERSTANDING PERFORMANCE OBJECTIVES,
CRITERION-REFERENCED MEASURES, AND PERFORMANCE GUIDES

Produced by

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CE 017 442

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INTRODUCTION

Vocational instructors are frequently faced with questions such as, "Are your students learning to perform the tasks they will be expected to perform in entry level jobs?" or "How do you know your instruction is job relevant?"

Fortunately, vocational education instructors in South Carolina have available or will have available in the near future Vocational-Technical Education Consortium of States (V-TECS) catalogs of performance objectives, criterion-referenced measures, and performance guides in many occupational areas. The catalogs are based on tasks workers say they perform on their respective jobs. Through the use of V-TECS catalogs, instructors will be able to demonstrate that their instruction is job relevant. In addition, these catalogs of performance objectives, criterion-referenced measures, and performance guides will aid instructors in confirming whether or not students are able to perform tasks at an identified level of competency.

This module is designed to describe briefly how V-TECS catalogs are developed and how performance objectives, criterion-referenced measures, and performance guides are used to implement performance-based vocational education.

DIRECTIONS

Module 1 should be completed before beginning work on this module.

Read the OBJECTIVE section. If you think you can accomplish this objective now, turn to the CHECK-OUT ACTIVITY, page 22, and follow the instructions.

If you feel you are not able to accomplish this objective now, look at the LEARNING ACTIVITIES, pages 1-2. Begin the learning activities and as soon as you feel you are ready, turn to the CHECK-OUT ACTIVITY, page 22, and follow the instructions.

OBJECTIVE

Given instructional materials developed for this module, the participant will be able with 100 percent accuracy, to select on a multiple choice test:

1. the major purpose of V-TECS
2. five elements of a V-TECS catalog
3. a performance objective and each of the three components comprising the objective
4. uses of performance objectives
5. a criterion-referenced measure
6. uses of the criterion-referenced measure
7. a performance guide
8. the proficiencies and attitudes necessary for completing a performance objective.

LEARNING ACTIVITIES

1. READ the Glossary of Terms for Module Two.
2. CHECK YOUR KNOWLEDGE by completing Self-Check I - Glossary of Terms for Module Two.
3. READ Section I - V-TECS Catalogs - A Source of Performance Objectives, Criterion-Referenced Measures, and Performance Guides.
4. CHECK YOUR KNOWLEDGE by completing Self-Check II - Elements of a V-TECS Catalog.
5. READ Section II - Performance Objectives.
6. CHECK YOUR KNOWLEDGE by completing Self-Check III - Performance Objectives.

7. READ Section III - Performance Guides.
8. READ Section IV - Criterion-Referenced Measures.
9. CHECK YOUR KNOWLEDGE by completing Self-Check IV - Criterion-Referenced Measures.
10. Turn to the Check-Out Activity, page 22, and follow directions.

GLOSSARY OF TERMS - MODULE 2

In this module there are terms used with which you may not be familiar. Read through the glossary. Then, check your knowledge by answering Self-Check I on the following page.

Affective learning - behavior exhibited by the learner dealing with changes in attitudes, interests and values and development of appreciation and adequate adjustments.

Cognitive learning - behavior exhibited by the learner dealing with recall and recognition of knowledge and the development of intellectual abilities and skills.

Criterion-referenced measure - an exercise based upon a performance objective and designed to measure attainment of that objective.

Duty - a group of related tasks, within a V-TECS catalog, which constitute a major area or segment of work.

Incumbent worker - a person holding a job in the referenced occupational area.

Performance guide - a series of steps, arranged in a sequence ordinarily followed which, when completed, should result in the performance of a task.

Performance objective - a statement in precise, measurable terms of a particular behavior to be exhibited by the student under specified conditions. (In a V-TECS catalog, the performance objectives are based on actual job performance).

Psychomotor learning - behavior exhibited by the learner dealing with the development of a manipulative or motor skill.

Task - a unit of work activity which constitutes logical and necessary steps in the performance of a duty. A task has a definite beginning and ending point in its accomplishments and generally consists of two or more definite steps.

V-TECS - Vocational - Technical Education Consortium of States - an organization with representation from 18 states and 2 agencies working to develop valid catalogs of performance objectives, criterion-referenced measures and performance guides.

V-TECS catalog - a collection of performance objectives, criterion-referenced measures, performance guides and related information organized by job structure within a group of related jobs.

SELF-CHECK I

Match the following terms with their appropriate definitions. Write your answers on a separate sheet of paper. Do not write on this sheet.

TERMS

- a. Task
- b. Performance guide
- c. V-TECS
- d. Incumbent worker
- e. Criterion-referenced measure
- f. Duty
- g. V-TECS catalog
- h. Performance objective
- i. Affective learning
- j. Cognitive learning
- k. Psychomotor learning

DEFINITIONS

- 1. - behavior exhibited by the learner dealing with change in attitudes, interests, and values and development of appreciation and adequate adjustments.
- 2. - an exercise based upon a performance objective and designed to measure attainment of that objective.
- 3. - a statement in precise, measurable terms of a particular behavior to be exhibited by the student under specified conditions.
- 4. - an organization with representation from 18 states and 2 agencies working to develop valid catalogs of performance objectives, criterion-referenced measures, and performance guides.
- 5. - a collection of performance objectives, criterion-referenced measures, performance guides and related information organized by job structure within a group of related jobs.
- 6. - behavior exhibited by the learner dealing in recall and recognition of knowledge and the development of intellectual abilities and skills.
- 7. - a series of steps arranged in sequence ordinarily followed which, when completed, should result in the performance of a task.
- 8. - a unit of work activity which constitutes logical and necessary steps in the performance of a duty. A task has a definite beginning and ending point in its accomplishments and generally consists of two or more definite steps.
- 9. - a group of related tasks, within a V-TECS catalog, which constitute a major area or segment of work within a duty area.
- 10. - behavior dealing with the development of a manipulative or motor skill.
- 11. - a person holding a job in the referenced occupational area.

Answer Key

1. i, 2. e, 3. h, 4. c, 5. g, 6. j, 7. b, 8. a, 9. f, 10. k, 11. d

SECTION I

V-TECS CATALOGS - A SOURCE OF PERFORMANCE OBJECTIVES, CRITERION-REFERENCED MEASURES, AND PERFORMANCE GUIDES

The vocational-technical education consortium of states, V-TECS, is a cooperative venture involving representation from 18 states and 2 federal agencies. The primary purpose of the consortium is to develop catalogs of performance objectives, criterion-referenced measures, and performance guides for vocational education through the sharing of resources and technology with other members of the consortium.

V-TECS was organized in 1973 with South Carolina joining its ranks in December, 1974. Other V-TECS member states are: Alabama, Delaware, Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, Mississippi, New York, Pennsylvania, Tennessee, Virginia, West Virginia, and Wisconsin. The air training command of the U. S. Air Force and the naval education training command of the U. S. Navy are associate members of the consortium.

How can we be sure member states develop catalogs of equal quality? First of all, a uniform procedure and format are used to ensure confidence in each product and thus make products transportable.

Secondly, the central staff of V-TECS closely monitors each product throughout development.

Once a state has identified an occupation it wishes to research and the V-TECS board approves the project, a review of relevant literature is made.

Based on information gleaned from the review of literature, duty groups (major areas or segments of work) are identified. An initial task and equipment list is developed. To validate the initial task and equipment lists, the project director interviews workers who currently perform the tasks. These workers may add and/or eliminate job tasks and equipment.

Once the task listing has been completed, a

random sample of workers who perform the job is selected. These workers are asked to complete an occupational inventory booklet. The information collected from this sample of workers is closely analyzed to determine tasks performed by workers and the amount of time workers spend on the performance of each task.

These job-relevant tasks are then converted to statements of performance objectives, criterion-referenced measures, and performance guides by a team of writers. This writing team consists of instructors who teach the occupation, workers who are currently employed in the occupation, and curriculum specialists. Thus a draft V-TECS catalog is created.

The draft catalog is then sent to a selected group of people in industry, business, and education for their analysis of the work of the writing team and their recommendations for changes. The final catalog is published, incorporating recommended changes of the field review analysis.

A look at a page taken directly from a V-TECS catalog helps one put into perspective the five elements of a catalog:

The duty is identified at the top of the page. The duty represents a major segment of work comprising related tasks.

The task statement follows the duty. A task is a unit of work activity which constitutes logical and necessary steps in the performance of a duty. A task has a definite beginning and ending point in its accomplishments and generally consists of two or more definite steps.

A performance objective is written for the task. This performance objective is a statement in precise, measurable terms of the particular behavior to be exhibited by a learner under specified conditions.

A criterion-referenced measure, an exercise based upon the performance objective and designed to measure attainment of that objective, follows the performance objective.

A performance guide, a series of steps arranged in the sequence usually followed which, when completed, should result in the performance of a task. The performance guide follows the criterion-referenced measure.

The order in which the elements appear on this sample page does not imply that this is the order in which each is written. The V-TECS handbook recommends that once the data have been analyzed and decisions made as to those tasks for which objective(s) will be written, it is necessary to perform another type analysis—the task analysis. The task analysis involves a detailed study of what a worker does in performing a task.

There are at least three methods of task analysis:

- Literature Review
- Worker Interview
- Observation of the Task Being Performed

These methods are much the same as those used in developing the preliminary occupational inventory, with the main difference being the detail with which the task is described. Most curriculum designers use a combination of the methods.

Once the step-by-step activities involved in task performance are identified and documented, a meaningful performance objective can be written.

Duty: OVERHAULING SMALL ENGINES

Task: Replace a cylinder on a 4-cycle engine

Performance Objective

When given inside micrometers, standard small engine mechanic tools and access to manufacturer's specifications, replace a cylinder. After the cylinder is replaced, the compression of the engine will be within 5% of the manufacturer's specifications. (10)

Criterion-Referenced Measure

Using a 4-cycle engine provided by the instructor, replace the cylinder.

Performance Guide

1. Visually inspect cylinder for obvious defect or wear.
2. Measure cylinder at top, center and bottom using inside micrometer, dial indicator or by using a ring and feeler gauge.
3. Refer to manufacturer's specifications for reject size.
4. Replace cylinder if needed.

Note: Usually in the case of lawn mower or chain saw engines, the entire block is replaced. However, some outboard engines have replaceable cylinders.

Taken from Small Engine Repair, A Catalog of Performance Objectives, Criterion-Referenced Measures and Performance Guides. (Columbia, South Carolina: South Carolina Department of Education, 1977), p. 90.

STATUS OF V-TECS CATALOGS*

FINAL CATALOGS PROJECT DESCRIPTION	CATALOGS UNDER DEVELOPMENT PROJECT DESCRIPTION	ASSIGNED CATALOGS PROJECT DESCRIPTION
Alterationist Auto Body Auto Mechanic Auto Parts Clerk Bank Teller Carpenter Cashier/Checker Child Care Combination Welder Computer Programmer Cosmetologist Cotton Ginning Data Processing Dental Assistant Emergency Medical Technician Floriculture Food Service Gardening - Grounds Home Furnishing Hospital Ward Clerk Housing Manager Industrial Sewing Legal Secretary Lic. Practical Nurse Machine Operator (Machinist) Nurse Aide Nurserymen Plumbing Radio/TV Services Secretary Ship Operations Small Engine Repair Tax Collector Textile Production Timber Harvesting Tractor Mechanic Turf Management	Ag Parts Clerk Ag Production Agrichemical Air Conditioning Appliance Repair Banking Clerk Bookkeeper Business Machine Repair Butcher Cabinetmaker Cattle Rancher Commercial Art Custom Dressmaker Diesel Mechanic Domestic Service Drafting Electrician Electronic Technician Executive Secretary Farm Equipment Mechanic Floral Sales Health Care Worker Heavy Equipment Mechanic Hotel/Motel Management House Electrician Masonry Material Handling Medical Assistant Medical Lab Assistant Oilfield Technician Patrolman Printing Retail Credit Security Guard Sheet Metal Solar Heating Mechanic Water/Wastewater Word Processing	Accounting Arch. Drafting Homemaker Mechanical Drafting Medical Office Assistant Retail Sales Textile Worker Two-way Radio Technician Word Processing - Adm.

V-TECS PRODUCT AVAILABILITY

Currently 37 catalogs have been completed by the V-TECS Consortium. Thirty-eight catalogs are under development while nine catalogs have been assigned. You will find project descriptions for each of the above categories on this page.

For further information on V-TECS catalogs, contact the state supervisor for the appropriate service area within the Program Planning and Development Section, Office of Vocational Education, State Department of Education, 904 Rutledge Building, Columbia, S.C. 29201.

*V-TECS Project Status and Product Availability Report, Southern Association of Colleges and Schools, Atlanta: 1978.

SELF-CHECK II

Elements of A V-TECS Catalog

Directions: Following is a list of the five elements found on a typical page taken from a V-TECS catalog and an example of each element. Match each element with the appropriate example. Write your answer on a separate sheet of paper. Do not write on this module. Check your answers with those at the bottom of this page.

EXAMPLES

1. Given cast iron workpiece(s), necessary equipment, tools and materials, gas weld joint(s). Weldment must have even weld beads, penetration of parent metal, and complete fusion with smooth even beads minus holes, craters or undercut.
2. Gas Weld Cast Iron
3. Select safety equipment.
Clean and prepare joints.
Select flux and filler rod.
Turn on and adjust for neutral flame.
Preheat workpiece as required.
Weld workpiece.
Clean and check weld.
4. Operating Gas Welding Equipment
5. Your instructor will provide you with cast iron workpieces, equipment, tools, and materials. Gas weld the joint so that the weldment (1) has even weld beads, (2) penetrates parent metal, and (3) is completely fused with smooth, even beads free from holes, craters, and undercut.

ELEMENTS

- a. Duty
- b. Task
- c. Performance Objective
- d. Criterion-Referenced Measure
- e. Performance Guide

SELF-CHECK II

Answer Key

1. c, 2. b, 3. c, 4. a, 5. d

SECTION II

PERFORMANCE OBJECTIVES

A performance objective is a statement in precise, measurable terms of a particular behavior to be exhibited by a student under specified conditions. In vocational education, tasks which workers perform on their jobs provide the primary basis for performance objectives.

In a previous section of this module, you learned these occupational tasks are derived from research which is conducted within a specific occupation. The research involves analyzing each occupation to determine the duties and tasks workers are performing. Decisions for designing training to provide students with entry level skills are based on the results of this research.

Once the needs of an occupation have been stated in research-based tasks, each task is further analyzed. The purpose of this analysis is to determine the major steps and procedures which make up each task as well as the conditions under which it is performed and the equipment it requires.

Each analyzed task is then translated into a performance objective which specifies:

1. The behavior or performance required of the student (what you expect the student to do).
2. The condition under which the student will perform the task. Some people refer to the condition as the "givens." In other words, what materials, equipment, and directions the instructor will give the student.
3. The standard of proficiency the student is expected to achieve. (How well you expect him/her to perform the task).

The standard the student is expected to achieve for each performance objective in a V-TECS Catalog is the level of performance agreed upon by a writing team. This level of proficiency is the entry level of proficiency

for a particular job. The decision of the writing team is based on experience in the field and/or information gleaned from germane literature.

The source of the standard is identified in parentheses after each performance objective, i.e. (1; 3:29). The first and second numbers in the parentheses refer to the sources identified in References for Standards, (Appendix B), a part of each V-TECS Catalog. The number following the colon represents the page in reference 3, from which a portion of the standard was derived. Listing a reference in no way implies that this is the only source of an appropriate standard, as there may be other valid sources.

Let's look at several objectives and determine if the condition, behavior, and standard are included.

Example 1: In the following objective, the condition is underlined with a single line, the behavior with two lines, and the standard with three lines. Read the objective.

Given a fiberglass panel requiring repair,
remove damaged material, fill damaged area
with recommended mixture of resin and
fiberglass. Finish to original contour.

Condition: Given a fiberglass panel requiring repair

Behavior (task): Remove damaged material, fill damaged area with proper mixture of resin and fiberglass.

Standard: Finish to original contour.

Example 2: Read the following objective.

Given shuttle and basic tool kit, inspect and prepare the shuttle for use. The shuttle will then run in a loom with a firm, smooth tension on the filling yarn.

In this example, the three parts are as follows:

Condition: Given a shuttle and basic tool kit

Behavior (task): Inspect and prepare the shuttle for use.

Standard: The shuttle will run in a loom with a firm, smooth tension on the filling yarn.

Example 3: Read the following statement. Does this objective incorporate the three parts?

Provided a burned patient and the necessary equipment and supplies, remove and replace a burn dressing.

Condition: Yes — "Provided a burned patient and the necessary equipment and supplies,"

Behavior (task): Yes — "remove and replace a burn dressing."

Standard: No

Properly written, the objective might read as follows:

Provided a burned patient and the necessary equipment and supplies, remove and replace a burn dressing. The dressing change must be accomplished without contaminating the burn site.

When a performance objective is written for a highly subjective product or process, a supplementary aid to the standard for the objective may be required. Instructor's Checklists have been found to be very helpful. Following is an example of a performance objective for which an accompanying instructors checklist was developed.

Duty: PERFORMING CHILD GUIDANCE ACTIVITIES

Task: Organize and guide dramatic play activities

16. Performance Objective

Given three groups of children at separate times and three suggested dramatic play activities, organize and guide one dramatic play activity for each group. Each of the three activities must be organized and guided in accordance with the instructor's checklist, and each applicable item on the checklist must be rated acceptable. (1, @)

Criterion-Referenced Measure

The instructor will assign you three groups of children at separate times and suggest three dramatic play activities. Organize and guide one appropriate dramatic play activity for each group.

Performance Guide

1. Provide activities compatible to various stages of development.
2. Choose and arrange equipment and supplies.
3. Prepare materials such as finger puppets and flannel-board cutouts.
4. Encourage socialization through participation.
5. Provide individual attention.
6. Provide for children with special needs.
7. Encourage self-expression.
8. Encourage children to be realistic when dramatizing real activities.
9. Practice positive guidance techniques.
10. Guide children in putting away materials and supplies.
11. Make a written or oral statement regarding the personal organization and performance of the activity.

INSTRUCTOR'S CHECKLIST: Organize and guide dramatic play activities
(P.O. 16)

ACTIVITY	RATING*	
	Acceptable	Unacceptable
1. Activity was appropriate for the group		
2. Chose appropriate equipment and supplies		
3. Arranged equipment and supplies in an orderly manner		
4. Prepared necessary materials		
5. Encouraged participation		
6. Provided individual attention		
7. Provided for children with special needs		
8. Encouraged self-expression		
9. Encouraged children to be realistic when dramatizing real activities		
10. Practiced positive guidance techniques		
11. Guided clean-up activities		
12. Objectively completed self-evaluation		

*All applicable items must be rated acceptable.

The following guidelines are suggested as an aid in writing checklists when they can be justified as a part or all of the standard.

GENERAL RULE

Do not copy the performance guide for use as a checklist. The performance guide contains all major steps and substeps required for performance of the task. Checklists should address only those elements requiring observations and evaluation.

FOR PROCESSES

- Determine the critical element which must be rated.
- Write each element into a past tense statement so that the rater can make a did/did not observation. Example: "Greeted customer with Good morning/Good afternoon. May I help you."

FOR PRODUCTS

- Determine the critical steps which must be rated.
- For each critical step write a complete past tense statement. Example: "Gave proper breathing instructions to patient."
- For each major product step write a past tense statement describing the product. Example: "Roots were fully extended."
- For each critical safety precaution write a past tense statement. Example: "Emergency brakes were applied." ¹

Module 6, Student Evaluation in Performance-Based Vocational Programs, contains a more detailed explanation for the use of Instructor's Checklists in evaluating performance.

TYPES OF PERFORMANCE OBJECTIVES

Performance objectives developed by V-TECS are generally psychomotor. That is, the performance is primarily a motor activity. We frequently refer to psychomotor objectives as a "hands-on" motor skill objective. Following is an example of a psychomotor objective taken from the *V-TECS Catalog of Performance Objectives, Criterion Referenced Measures and Performance Guides for Plumbing*:

Task:

Replace pressure control switches on water pumps

Performance Objective:

Given a screwdriver and a set of open-end wrenches, replace a malfunctioning pressure control switch on a pump. The new switch must function to provide an amount of water at a pressure level designated by the pump manufacturer.

There are tasks within occupational areas, however, that require cognitive or affective performance objectives. Cognitive objectives deal with knowledge and the development of the intellectual abilities and skills. Following is an example of a cognitive performance objective:

Task:

Plan outdoor play activities

Performance Objective:

Given two case situations and access to reference materials, plan one outdoor play activity for each of the four seasons for each of the case situations. The plan may be written or oral and must include all the items on the "Student Work Sheet For Planning Creative Activities."

This example was taken from the *V-TECS Catalog of Performance Objectives, Criterion-Referenced Measures, and Performance Guides for Child Care Worker*.

Affective objectives deal with changes in values, attitudes, and interests and the development of appreciations and adequate adjustment. The following example was taken from the *Catalog of Performance Objectives Criterion-referenced Measures, and Performance Guides for Emergency Medical Technician*.

Task:

Soothe the fears of child involved in accident

Performance Objective:

Given an excited, injured or ill pediatric patient, reassure and calm patient. Methods used must aid reassurance and calming of patient.

V-TECS recognizes the importance of cognitive and affective objectives in vocational education, and admittedly there are occupational tasks in which cognitive and affective performance objectives are required. But, as stated earlier, performance objectives in vocational education are predominantly psychomotor. Therefore, V-TECS member states are responsible for developing their own cognitive and/or affective objectives as enabling activities leading to the terminal performance specified in the psychomotor objective. Thus, as a teacher, you will want to introduce these mental and attitudinal activities throughout the instructional process.

In summary, a well-written performance objective includes a statement of (1) the behavior or performance expected of the student; (2) the conditions under which the performance takes place; and (3) the acceptable standard of performance.

Precisely written performance objectives can assist the vocational educator in a number of ways. The performance objective allows the student, instructor, curriculum specialist, materials designer, and school administrator to know exactly what the student is to do and the behavior to be demonstrated. The task to be performed specifies the content of instruction. The conditions identify the tools, equipment, supplies and learning environment required. Finally, the standard of performance stated in the objective provides the basis for the criterion test.

SELF-CHECK III

Performance Objective

Directions: Following is a list of the three parts of a performance objective and an example of each. Match each part with the appropriate example for each of the three cases. Write your answer on a separate sheet of paper. Do not write on this module. Check your answers with those found at the bottom of this page.

EXAMPLES OF PARTS OF A PERFORMANCE OBJECTIVE

Objective I

1. Read and interpret by writing the name and purpose of all welding symbols, lines and views that apply to welding fabrication.
2. The names and purposes of symbols, lines and views listed will be 90% accurate.
3. Given a blueprint.

Objective II

1. Add cuffs as indicated.
2. Given a garment with sleeves and necessary equipment and supplies.
3. Cuffs must be size and style indicated.

Objective III

1. In accordance with manufacturer's specifications.
2. Given an automobile, and access to the appropriate service manual, tools and equipment.
3. Remove and replace the fan belt.

PARTS OF A PERFORMANCE OBJECTIVE

- a. Condition
- b. Behavior
- c. Standard

Answer Key

1. c, 2. a, 3. b	III
1. b, 2. a, 3. c	II
1. b, 2. c, 3. a	I

SECTION III

PERFORMANCE GUIDES

A performance guide, as defined by V-TECS, is a series of steps arranged in a sequence ordinarily followed which, when completed, should result in the performance of a task. The performance guide identifies not only the sequence in which the task might be performed, but also, upon analysis, aids the educator in identifying the things a student should know and the attitudes required for performing the task.

Earlier in this module, checklists were discussed relative to performance objective standards. A checklist may be used to rate how well a task is performed. The performance guide describes what is to be done, the sequential steps in task performance. Compare the following examples illustrating the performance guide and the checklist for a performance objective:

EXAMPLE 1

PERFORMANCE OBJECTIVE

Given a situation requiring the meeting of customers in a good-will capacity, meet the customers. A checklist will be used to rate performance. All items must rate acceptable.

PERFORMANCE GUIDE	PROCESS CHECKLIST		
		Acceptable	Unacceptable
1. Greet customers in a friendly manner.	1. Greeted customers with a smile.		
2. Seat customers if required.	2. Used a pleasant voice.		
3. Make customers comfortable.	3. Used correct grammar and pronunciation of words.		
4. Assist in meeting needs of customers efficiently and courteously.	4. Acted in a courteous manner.		
	5. Acted in a friendly manner.		
	6. Listened carefully.		
	7. Met needs of customers satisfactorily.		

The above illustration is an example of a process checklist. Following is an example of a product checklist. Again, compare the performance guide which describes what is to be done with the checklist which rates how well the task is to be done.

EXAMPLE 2

PERFORMANCE OBJECTIVE

Given the necessary ingredients, equipment, and a standardized recipe for two types of dough (rich and lean), bake one bread from each type dough. A checklist will be used to rate performance. All items must receive an acceptable rating.

PERFORMANCE GUIDE	PRODUCT CHECKLIST		
	Outside Characteristics:	Acceptable	Unacceptable
1. Gather supplies and equipment.	1. Shape: Well-proportioned; symmetrical; rounded top.		
2. Measure or weigh ingredients.	2. Size: Large but not airy in proportion to weight.		
3. Add yeast to lukewarm water.	3. Color: Even, rich golden brown.		
4. Mix ingredients.	4. Crust: Tender; crisp; even thickness; free from cracks.		
5. Knead dough.	Inside Characteristics: 5. Color: Creamy white; free from streaks.		
6. Let rise.	6. Grain: Fine; thin-walled cells, evenly distributed.		
7. Roll dough.	7. Texture: Tender; soft; slightly moist.		
8. Cut dough and shape.	8. Flavor: "Wheaty," sweet, nutty.		
9. Place shaped dough into prepared pan for proofing.			
10. Permit each pan of rolls to double in bulk under proper moisture and temperature conditions.			
11. Place in preheated oven at the required temperature and bake until done.			

Generally the checklist, when used, is shorter than the performance guide as was illustrated in the second example. This is the case since the performance guide usually contains a more detailed description of major steps involved in task accomplishment.

IDENTIFYING PREREQUISITE SKILLS/KNOWLEDGE/ATTITUDES

Performance Guides, upon analysis, suggest prerequisite skills, knowledge, and attitudes required for task performance. Read the following objective and performance guide:

Performance Objective

Given a damaged vehicle requiring fiberglass panel replacement, remove damaged fiberglass panel and install replacement panel. Finish sand-applied resin and fiberglass cloth to original contour.

Performance Guide

1. Inspect damage.
2. Select proper tools, equipment and materials.
3. Select necessary safety equipment. (*NOTE: Be sure to use this equipment since fiberglass, resins and solvents can be very injurious to health if improperly used.)
4. Remove damaged panel.
5. Prepare replacement panel.
 - a. Sandblast or grind surfaces to be bonded.
 - b. Clean and dry surfaces to be bonded.
6. Properly mix resin with catalyst according to supplier's instructions.
7. Apply resin to bonding surfaces.
8. Secure replacement panel in place with "C" clamps or pop rivets.
9. Saturate fiberglass cloth in resin and apply to joint surface as needed.
10. Allow sufficient drying time.

11. Remove clamps and drill out pop rivets.
12. Grind and fill seams.
13. Smooth filled areas to original body contour.

By closely analyzing the performance guides above, you can identify entering skill/knowledge requirements.

Following are some of the skills/knowledge necessary for the performance of the task as outlined in the performance guide.

Prerequisite Skills/Knowledge/Attitudes

1. Types of fiberglass panel damage with implications for removal.
2. Tools, equipment, and materials for fiberglass panel removal.
3. Safety facts about fiberglass.
4. Steps in panel removal.
5. Location of brackets and clips.
6. Steps in preparing replacement panel (in sandblasting, grinding, and cleaning surfaces).
7. Steps in mixing resin with catalyst.
8. Steps in applying resin.
9. Steps in securing replacement panel.
10. Length of drying time required.
11. Steps in finishing.

These are skills/knowledge the student will need in order to perform the task as identified in the performance guide.

You, the instructor, must identify skills/knowledge and attitudes required to perform the task. You build these into your instruction as you deem necessary.

Attitudes and feelings (affective learning) as well as knowledge (cognitive learning) should be built into the instruction, especially in program areas dealing with human relationships. The following example taken from the V-TECS Child Care Worker Catalog illustrates this point.

Performance Objective:

Given three groups of children at separate times, organize and guide one appropriate music activity for each group. The organization and guidance of each activity must be in accordance with the instructor's checklist with each applicable item rated acceptable.

Performance Guide:

1. Provide activities suitable for various stages of development.
2. Choose and arrange equipment.
3. Choose and arrange materials and supplies.
4. Give oral directions.
5. Distribute supplies.
6. Encourage group participation.
7. Encourage individual participation.
8. Practice positive guidance techniques.
9. Provide for individual differences.
10. Make a written or oral statement regarding the personal organization and guidance of the activity.

By analyzing the performance guide, instructors can identify cognitive and affective learning which should be built into his/her instruction similar to the following:

"MUST KNOW"

1. activities suitable for each stage of development (must have knowledge of developmental stages)
2. types of equipment, arrangement for safety and utility
3. different materials and supplies available
4. steps in giving directions
5. steps in distributing supplies
6. techniques of motivating individuals and groups
7. techniques for positive guidance
8. individual differences

"MUST FEEL"

1. like and enjoy being with young children
2. concern for a child's safety
3. enthusiasm in teaching children
4. genuine interest in each and every child
5. respect for children in order to guide them positively

Through the analysis of performance guides, you will be able to identify prerequisite psychomotor, cognitive and affective skills required for task performance. Once these skills are identified, you build these into your instruction as you see fit.

SECTION IV

CRITERION-REFERENCED MEASURES

A criterion-referenced measure precisely tests a performance to the specified standard under the stated conditions of the performance objective. The purpose of the criterion-referenced measure is to let the student and instructor know when the student has successfully completed a specific performance objective.

The criterion-referenced measure must reflect as closely as possible the performance objective on which the measure is based. More precisely, the criterion must be the same as the standard stated in the objective, and the task performed must be the same as that specified in the objective. The conditions specified in the performance objective should also be the same as those called for in the criterion-referenced measure.

There are some educators who feel that the criterion-referenced measures written for the 37 V-TECS Catalogs which have been published and distributed to date are inadequate. For this reason, South Carolina will develop and evaluate criterion-referenced measures using the following guidelines.

1. The criterion-referenced measure should require performance of the same behavior as specified in the objective. Consider the following example.

Performance Objective:

Given five parcels to be weighed for mailing and the required postal regulations, prepare the parcels for mailing to include wrapping, tying, labeling, weighing, and determining the correct postage for each in accordance with the postal regulations.

Criterion-Referenced Measures

Referring to the postal regulations, determine the postage for each of the following:

- a. 13 oz. 1st class
- b. 2 lbs. 4th class
- c. 16 oz. 1st class

In this example, the performance objective specified one behavior; the criterion-referenced measure required a different one. That measure, therefore, is not acceptable because it does not require the same behavior. A criterion-referenced measure of the same behavior would read as follows:

Obtain five packages to be mailed from your instructor. Then prepare each package for mailing to include wrapping, tying, labeling, weighing and writing the correct amount of postage on each package. You may refer to the postal regulations.

2. The criterion-referenced measure must test all of the behavior specified in the objective. Referring to our previous example, suppose it read "Wrap the five packages." It would be unacceptable because it measures only part of the performance objective.
3. The terminology in the criterion-referenced measure should be compatible with that in the performance objective. For example, if the objective specifies "...type a business letter..." the measure should also direct the student to "...type a business letter..." not "...write a letter..." or "...prepare a business letter..."

4. The criterion-referenced measure must require the same conditions as those specified in the performance objective. In our previous example, postal regulations were included in the conditions. But if a criterion-referenced measure directed the student to "...use the notes you made in class..." or "...work from memory..." that measure would not be true to the objective because conditions were changed. The same conditions must be required in the criterion-reference measure.
5. Do not merely copy the performance objective to use as a criterion-referenced measure. *The performance objective is a behavioral specification of the task performance; the criterion-referenced measure is a statement telling the student to do the task.*
6. Do not repeat the performance guide in the criterion-referenced measure. The performance guide outlines the major steps in the task. If some kind of procedural guide (checklist, task sheet, chart, etc.) is included as a condition, then simply tell the student to use it.¹

Criterion-referenced measures, when properly written, can be used by instructors in the following ways:

1. To aid in designing instruction so that test conditions and standards are the same for the instructional situation and the test situation.
2. To aid in determining the student's ability to perform before entering the course of study and to identify those objectives for which the student needs additional instruction.
3. To assist in evaluating instruction so that alternative learning activities may be developed.

¹ *Developing Performance Objectives and Criterion-Referenced Measures for Performance-Based Instruction in Vocational Education* (Montgomery, Alabama: State Department of Education, 1977), p. 22-23.

SELF-CHECK IV

Criterion-Referenced Measures

Directions: Following are three performance objectives with criterion-referenced measures. Select the one which is written according to the guidelines suggested in the reading, Section IV, Criterion-Referenced Measures. Record your answer on a separate sheet of paper. Check your response with the self-check answer key at the bottom of this page.

1. Performance Objective:

Given a garment with sleeves and necessary equipment and supplies, add cuffs as indicated. Cuffs must be size and style indicated.

Criterion-Referenced Measure:

Add cuffs to garment provided.

2. Performance Objective:

Given two home furnishing articles, velcro, snap tape, and the needed equipment and supplies, attach velcro to the opening of one of the articles and snap tape to the opening of one of the articles. The completed openings will lie smoothly, will open and close easily; any exterior stitching will be straight and even; and the fastener will not show on the right side. (3)

Criterion-Referenced Measure:

You will be provided two home furnishing articles, velcro and snap tape. Attach each fastener to an article provided.

The completed openings will meet these specifications:

(1) Lie smoothly; (2) Open and close easily; (3) Exterior stitching is straight and even; (4) Fastener does not show on right side.

3. Performance Objective:

Given a SMAW machine, work order with sketch, necessary tools and accessories; remove, disassemble, inspect, reassemble and reconnect cables, ground clamp and electrode holder in accordance with and in the sequence listed in the work order.

Criterion-Referenced Measure:

Remove, disassemble, inspect, reassemble and reconnect cables, ground clamp and electrode holder on a SMAW unit.

SELF-CHECK IV

Answer Key

Number 2 is written according to the guidelines suggested in the reading.

CHECK-OUT ACTIVITIES

Inform your instructor that you are ready to be tested. You will be provided with a copy of a multiple choice test and an answer sheet. Record your answers on the answer sheet and return both the test and the answer sheet to the instructor.